

REMARKS

Claims 1-28 are pending, with claims 1, 15 and 16 being independent. Claim 29 was cancelled by a previous preliminary amendment without waiver or prejudice.

Applicant's responses to specific rejections are presented below following excerpted text of the Office action, which is presented in indented, bold, single-spaced, 9 point font.

Claim Objections

4. Applicant is advised that should claim 23 be found allowable, claim 24 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP 5 706.03(k).

Applicant respectfully disagrees. Applicant respectfully requests reconsideration and withdrawal of the objection to claim 24 because claim 24 is not a substantial duplicate of claim 23. Claim 23 recites in part that "each subset condition value has at least one relationship vector component *with the initial value.*" (Emphasis added). Claim 24 recites in part that "each subset condition value has at least one relationship vector component *with a value greater than the initial value.*" (Emphasis added). Claim 23 and claim 24 are reciting different limitations with respect to each subset condition value. Thus, claim 24 is not a substantial duplicate of claim 23.

For at least this reason, Applicant respectfully requests reconsideration and withdrawal of the claim objections.

Claim Rejections - 35 USC § 101

5. Claim 15 fails to fall within a statutory category of invention. It is directed to the program itself, not a process occurring as a result of executing the program, a machine programmed to operate in accordance with the program nor a manufacture structurally and functionally interconnected with the program in a manner which enables the program to act as a computer component and realize its functionality. It's also clearly not directed to a composition of matter. Therefore, it's non-statutory under 35 USC 101.

Applicant has amended claim 15 to obviate the rejection. As amended, claim 15 recites a computer program product for logically evaluating a Boolean expression used in a query statement, where the computer program product is tangibly embodied on a computer-readable medium and includes executable instructions that, when executed, is configured to cause at least

one processor of a computing device to perform recited operations. Thus, amended claim 15 recites statutory subject matter.

For at least this reason, Applicant respectfully requests reconsideration and withdrawal of the § 101 rejection of claim 15.

6. Regarding claims 16-28, in particular claim 16, the claim recites a "processor" and "memory". In the absence of any modifying disclosure of this limitation in the specification, the examiner interprets the term 'processor' as limited to hardware embodiments; and the term 'program storage device' as excluding printed paper, transmission media, signals, or any form of energy, such that the claim clearly falls within a statutory class of invention as required under the terms of 35 U.S.C. 101.

Applicant submits that claims 16-28 do not stand rejected under 35 U.S.C. § 101 and that claims 16-28 recite statutory subject matter without amendment.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-28 rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6439783 by Gennady Antoshenkov (hereafter Antoshenkov).

Claim 1:

Antoshenkov discloses the following claimed limitations:

"receiving the Boolean expressions;"[col. 8 line 9, a query may be a Boolean expression. Accordingly, receiving the Boolean expressions (query)]

"decomposing the Boolean expression into the plurality of conditions;"[abstract, the query is converted to a Boolean tree in canonical form. Col. 8 lines 66-67, a Boolean tree which has been constructed from the following query: ((s1>21) and (s2=140000)) or not((s1<=30) or not(s2>20000) or (s2/1000<=s1)) . Accordingly, decomposing (constructed) the Boolean expression (query) into the plurality of conditions (figure 4a and ((s1>21) and (s2=140000)) or not((s1<=30) or not(s2>20000) or (s2/1000<=s1)))]

"for each condition of the plurality, extracting from the condition at least one condition value referring to the attribute, wherein the at least one condition value defines a value range of the condition;"[Col. 8 lines 66-67. Accordingly, for each condition of the plurality(((s1>21) and (s2=140000)) or not((s1<=30) or not(s2>20000) or (s2/1000<=s1))), extracting from the condition at least one condition value referring to the attribute (s1, s2), wherein the at least one condition value defines a value range of the condition (>21, =14000, <=30, etc.)]

"inserting the at least one condition value in a condition value list in sorted order;"[col. 7 lines 2-5, the results of the evaluation are placed in the range vector. The rank vector is sorted by the range values, and each range is given a rank number. Accordingly, inserting (placed) the at least one condition value (range) in a condition value list (rank vector) in sorted order (sorted range values).]

"initializing a relationship vector for the at least one condition value; and"[figure 4b and figure 10]

"adjusting the relationship vectors for the at least one condition value and for each further condition value that is in the condition list and that is in the value range of the condition." [col. 7

lines 8-1 5. Accordingly, adjusting the relationship vectors (boolean tree is further optimized) for the at least one condition value (range) and for each further condition value (ranges) that is in the condition list (rank vector) and that is in the value range of the condition (range values)]

Applicant respectfully disagrees. Applicant respectfully requests reconsideration and withdrawal of the rejection because Antoshenkov does not describe or suggest initializing a relationship vector for the at least one condition value and adjusting the relationship vector for the at least one condition value and for each further condition value that is in the condition list and that is in the value range of the condition, as recited in independent claim 1.

First, Antoshenkov does not describe or suggest initializing a relationship vector for the at least one condition value. Applicant's specification describes, in one exemplary implementation, that a relationship vector may include a LESS THAN component, an EQUAL TO component, and a GREATER THAN component, where each of these components may be realized as a counter. See Published Application, para. [0057], FIG. 4, and para. [0075]. Thus, as illustrated in FIG. 4 and described in the corresponding text, each condition value may have a relationship vector.

Antoshenkov does not describe such a relationship vector. Instead, Antoshenkov describes a segment vector, a range vector, a mixed vector and a sorted rank vector. Specifically, Antoshenkov describes:

"In addition to the data structure representing the tree, secondary data structures, in the form of vectors, may be created during the compile phase. The vectors facilitate further manipulation of the tree for optimization purposes.

A segment vector is created with one entry for each key segment in the query. The segment vector stores information specific to each of the key segments composed in the query, for example, the number of predicates that use the segment.

Entries in a range vector store the low and high values of the ranges of the segments. If these values are expressed as constants, they can be "bound" to the segment during the compiling phase. Otherwise, if they are expressed as variables, they are stored in the range vector during the subsequent binding phase.

A mixed vector has entries storing information needed to process the mixed predicates of the query, for example, the memory address of the associated machine executable code.

A sorted rank vector contains pointers to all the ranges in the range vector. As will be described herein, key evaluation according to the principles of the invention is by range "rank" instead of actual range values as in traditional query optimizer methods. Evaluating keys by rank simplifies and speeds up key evaluation greatly."

See Antoshenkov, col. 6, lines 27-49. None of these vectors described in Antoshenkov describe a relationship vector, as recited in independent claim 1.

Second, Antoshenkov does not describe or suggest adjusting the relationship vector for the at least one condition value and for each further condition value that is in the condition list and that is in the value range of the condition, as recited in independent claim 1. As discussed above, Antoshenkov does not describe or suggest a relationship vector. Since Antoshenkov does not describe or suggest a relationship vector, Antoshenkov does not describe or suggest adjusting the relationship vector.

For at least these reasons, Applicant respectfully requests reconsideration and withdrawal of the § 102 rejection of independent claim 1 and its dependent claims 2-14.

Similarly to claim 1, independent claims 15 and 16 recite a computer program product (claim 15) and a computer system (claim 16) that recite a processor that is configured to initialize a relationship vector for the at least one condition value and adjust the relationship vectors for the at least one condition value and for each further condition value that is in the condition list and that is in the value range of the condition. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the § 102 rejection of independent claims 15 and 16 and claims 17-28, which depend from independent claim 16.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance. The Examiner is invited to telephone Applicant's attorney (202-470-6457) to facilitate prosecution of this application.

No fees are believed to be due at this time. If necessary, please charge any deficiencies or credit any overpayment to Deposit Account No. 50-3521, referencing Attorney Docket No. 2003P00256WOUS/0010-017001.

Respectfully submitted,
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